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Chapter 3. Imperative to Invest in Innovation and Infrastructure

About This Chapter

This chapter describes the urgency behind continuing to invest in integrated water management in California. Strategic investments in both innovation and infrastructure (water facilities and ecosystem) will provide for future public safety enhancements, economic prosperity, and environmental stewardship. This course of action will help avert several foreseeable societal catastrophes such as loss of life and property from floods, unreliable water supplies, and declining ecosystems.

The primary use of this chapter is to guide strategic, disciplined investment, and remove implementation impediments by working to achieve the Water Plan’s vision, mission, goals, and objectives, which are also described in this chapter. The roadmap in this chapter (in conjunction with more specific actions in Chapter 8, “Implementation Plan”) will help reduce uncertainty and improve the reliability of the California’s watersheds and water systems for all uses. In turn, California’s business climate and quality of life will be improved. An open and transparent planning process will lead to stakeholder and decision-maker support for investment in various areas of resource management.

This chapter describes the following:

- A Critical Time to Invest.
- Fundamental Lessons.
- Focus of Update 2013 — Three Overarching Themes.
- Looking to the Future — The Roadmap.
 - Vision.
 - Mission.
 - Goals.
 - Objectives.
 - Guiding Principles.
- Companion Plans.
- Role of State Government in Integrated Water Management.

A Critical Time to Invest

Water planners, managers, and stakeholders, throughout California agree that our state is facing a convergence of unprecedented challenges. Such challenges range from social (e.g. complicated governance, divergent priorities among stakeholders, unwillingness or inability to pay for public infrastructure or services) to geophysical (e.g. climate change, limitations of natural resource, limitations of existing physical infrastructure).

PLACEHOLDER Box 3-1 [Title to come]

[Any draft tables, figures, and boxes that accompany this text for the advisory committee draft are included at the end of the chapter.]

Resolving these challenges is becoming more difficult as time passes. While many of the most cost-effective system infrastructure improvements have already been constructed, past implementation did not always adequately account for costs of ecosystem or other improvements that society values today. As a result, future system improvements are going to cost more. Adequate funding will be further complicated by the lingering effects of the financial crisis that State, federal, and local agencies have faced in recent years.

And, California still faces many of the conditions that were highlighted in Update 2009. While the drought that the State faced in 2009 has passed, January and February 2013 (when much of the snowpack should accumulate) were observed as the driest such months since 1921 – raising the question, is this the start of another critical drought? [replace with whatever is appropriate at time of printing] In many cases, the effects of the challenges described below can compound to create problems larger than their sum. Over the longer term, climate change will continue to reduce our snowpack storage, increase sea level, degrade water quality in the estuaries – all of which reduce water supply reliability and increase flood risk. Court decisions and regulations have resulted in the reduction of water deliveries from the Sacramento-San Joaquin River Delta by about 20 to 30 percent. Key fish species continue to decline. In some areas of the state, our ecosystems and quality of underground and surface waters are unhealthy.

California needs to step up and sustain investment in innovation and infrastructure (constructed and ecosystem) as described in Update 2013 (see Chapter 7, “Finance Planning Framework”) or live with the reduction in public safety, quality of life and environmental stewardship for future generations – all of which are unacceptable conditions. The challenges identified in Chapter 2, “California Water Today,” can be viewed as independent issues facing water management. Combinations of these challenges can be summarized into the following critical conditions that make this a critical time to invest. For example, population, land use, geophysical variability, and other challenges all have an effect on how droughts affect each region.

Greater Drought Impacts

Droughts cause economic harm to urban and rural communities, loss of crops, potential for species collapse, extreme fire danger, degrade water quality and increase stresses on groundwater aquifers. Even a single dry year can negatively affect activities that are wholly dependent on unmanaged water supplies, such as dryland farming, livestock grazing, and many recreational water uses. Multiple consecutive dry years have and will continue to occur which exponentially increases impacts due to reductions in available surface and groundwater supplies. Vulnerabilities to drought are increasing due to the several factors including: growing population; increases in permanent crops; implementation of the most cost-effective or implementable resource management strategies (e.g. water users who have already increased efficiency may find it more challenging to achieve additional water use reductions during droughts) more volatile and unpredictable climate patterns, and ecosystems that are already struggling due to other factors. During dry years, water management becomes more complex and as various water users may seek to use the same water.

PLACEHOLDER Figure 3-1 Historical Droughts in California

[Any draft tables, figures, and boxes that accompany this text for the advisory committee draft are included at the end of the chapter.]

Increasing Flood Risk

California has nearly \$600 billion of assets and over 7 million people at risk of flooding. Every Californian, however, is exposed to the significant impacts from flooding due to disruption of commerce, response and recovery costs, the secondary economic impacts that would ripple through the state's economy (e.g. redirection of funding from other state services), and as taxpayers that participate in recovery from floods. People continue to move into floodplains and flood-prone areas throughout the state. Sacramento, California's capital, has one of the lowest levels of flood protection of any major city in the nation. Under certain circumstances, some urbanized communities in the region could be flooded by more than 20 feet water. The threat of catastrophic flooding, especially in the deep floodplains of the Central Valley and Delta, is a continuing concern, especially for public safety. If not proactively managed in the future, economic, environmental, and social impacts from recent catastrophes such as flooding from Hurricanes Katrina and Sandy will continue to occur.

PLACEHOLDER Figure 3-2 Types of Flooding in California

[Any draft tables, figures, and boxes that accompany this text for the advisory committee draft are included at the end of the chapter.]

Declining Ecosystems

The ecosystems in many areas of the state have declined; many species have been listed as threatened or endangered. Watershed health including lack of suitable habitat, competition with invasive species, pollution, and water management activities contribute to the decline. One of the most obvious examples of an ecosystem in crisis is the Sacramento- San Joaquin River Delta. Salmon, delta smelt, and other species are at their lowest levels since their records have been kept, about 50 years. This decline has led to court restrictions and new regulations on Delta diversions.

PLACEHOLDER Figure 3-3 Sensitive Species in California

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Degraded Surface and Groundwater Quality

The quality of groundwater and surface waters varies significantly throughout the state. Degradation is occurring naturally and as a result of human activities. We need improvements in drinking water treatment, cleanup of polluted groundwater, salt management, and urban runoff management. A high priority is creating healthy watersheds to keep source water free of pollutants like pathogens and chemicals that are regulated or will be regulated in the near future. Recently, some unregulated chemicals and pollutants are emerging as actual or potential contaminants. They can be in pharmaceuticals and personal care products, byproducts of fires and fire suppression, or discarded elements of technology.

Aging Infrastructure

Conditions today are much different than when most of California's water system was constructed; and upgrades have not kept pace with changing conditions, especially considering growing population; changing societal values, regulations, and operational criteria; and the future challenges accompanying climate change. California's flood protection system, composed of aging infrastructure with major design and construction deficiencies, has been further weakened by insufficient maintenance in some areas. State and regional budget shortfalls and a tightened credit market may delay new projects and programs.

Changing Water Demands

California's changing and potentially competing demands for water comes from many sectors. All uses generally can be characterized as urban, agricultural, or environmental. The state's population continues to grow and the trend has been faster growth in warmer inland regions. From 1990 to 2010, California's population increased from about 30 million to about 37.3 million. The California Department of Finance projects that this trend means a state population of roughly 51 million by 2050. Chapter 5, "Managing an Uncertain Future," presents scenarios of future changes in water demand through 2050 considering uncertainties surrounding future population growth, land use decisions, and climate change.

Physical Variability and Social Diversity

The above critical conditions become more difficult in the face of physical variability and social diversity. California is often recognized as a land of extremes — its diversity in cultures, ecosystems, geography, and water resources. Precipitation, which is a primary source of California's water supplies, varies from place to place, season to season, and year to year. Most of the state's snow and rainfall in the mountains in the north and eastern parts of California, and most water is used in the valleys and along the coast. In addition, the state's ecosystem, agricultural, and urban water users have variable needs for the quantity, quality, timing, and place of use. The water and flood systems face both the threat of too little water to meet needs during droughts and too much water during floods. The physical and social realities within California do not allow for a one-size-fits-all water management and planning. California's State, federal, tribal, regional, and local projects and programs must work together to make water available in the right places and times and to safely move floodwaters.

California's various cultures, organizations and individuals naturally assign different values and priorities to these IWM-related assets, services and benefits. They also naturally have different reliance on, or rates of consumption of, IWM-related resources. Disparate priorities, practices, and resource consumption rates define California's rich social diversity. To further complicate planning, various regions of the state experience differences in natural hydrology, ecosystem condition, water supply and use, flood risk, and in opportunities and needs for system improvements. Therefore, while investments for statewide water management must be made, the focus of planning needs to be on a regional basis.

See Chapter 2, "California Water Today," for a more complete description of variability and diversity throughout California.

Climate Change

The above conditions become more difficult and uncertain given potential future climate change. Water sector vulnerability to climate change stems from changes in hydrology that affect frequency, magnitude,

and duration of extreme events including flooding and drought. In turn, these affect water quantity, quality, and infrastructure. Reduction in snowpack storage affects water supply reliability, hydropower, and the amount of runoff during extreme precipitation that leads to flooding. Rising sea levels increase susceptibility to coastal flooding. These climate change conditions also impact Delta levee integrity and water quality. Changes in Delta water quality and need to meet water quality requirements may require changes in upstream water management and resultant changes in local water supply reliability and water quality. Recreation and tourism are also likely to suffer due to lower water levels in waterways and reservoirs and declining snowpack.

PLACEHOLDER Figure 3-4 Climate Change Effects in California

[Any draft tables, figures, and boxes that accompany this text for the advisory committee draft are included at the end of the chapter.]

Specific consequences to the state resulting from climate change are that higher temperatures will melt the Sierra snowpack earlier and drive the snowline higher, resulting in less snowpack to supply water to California users. Rainfall events may become more frequent and intense, contributing to increased flood risk. Droughts may become more frequent and persistent this century. Accelerating sea level rise will produce higher storm surges during coastal storms. Together, higher winter runoff and sea level rise will increase the probability of levee failures in the Sacramento-San Joaquin Delta. Sea level rise will also place additional constraints on water management and exports from the Sacramento-San Joaquin Delta, especially due to increased salinity from tidal exchange in the Delta. By the end of the 21st Century, the magnitudes of the largest floods may increase to 110 percent to 150 percent of historical magnitudes (Das, Dettinger, Cayan, and Hidalgo 2011; Pierce et al. 2012).

Future Uncertainty

California must invest in IWM activities in the face of many uncertainties. There are enormous uncertainties facing water managers in planning for the future. How water demands will change in the future, how ecosystem health will respond to human use of water resources, what disasters may disrupt the water system, and how climate change may affect water availability, water use, water quality, and the ecosystem are just a few uncertainties that must be considered. The goal is to anticipate and reduce future uncertainties, and to develop water management strategies that will perform well despite uncertainty about the future. Uncertainties will never be eliminated, but better data collection and management and improved analytical tools will allow water and resource managers to better understand risks within the system. Chapter 5, “Managing an Uncertain Future,” provides more detail on risk and uncertainty in California water resources management.

The California Water Plan acknowledges that planning for the future is uncertain and that change will continue to occur. It is not possible to know for certain how population growth, land use decisions, water demand patterns, environmental conditions, the climate, and many other factors that affect water use and supply may change by 2050. To anticipate change, our approach to water management and planning for the future needs to consider and quantify uncertainty, risk, and sustainability. Californians must fundamentally change how we use and manage water and account for future uncertainty. Integrated water management using a diversified portfolio of management actions along with seeking flexibility in water management are important for managing this uncertainty.

Consequences of Foregone Investment

The opportunity provided by IWM includes a future in which water demands are met, the quality of water sources and supplies are improved, system flexibility and resiliency are improved to deal with droughts and floods, and ecosystems are restored and enhanced to sustain our natural resources. Insufficient investment in IWM, on the other hand, would bring severe threats to public safety, environmental stewardship, and economic stability. Just as a car needs to be regularly maintained and rehabilitated to avoid risking a costly breakdown, IWM requires continuous investment even to sustain current levels of performance and avoid a costly and less prosperous future that puts businesses and investments at risk, destroys cherished ecosystems, and makes our communities less safe and desirable. Much of the water infrastructure that we rely on today was the result of the investments from previous generations. California cannot afford to sacrifice our future by failing to invest in our water today. Volume 4, “Reference Guide,” provides more information on the cost of forgone investment.

Fundamental Lessons

The Update 2013 strategic plan sets an urgent course for action that is informed by fundamental lessons learned by California’s water community through the experience of recent years. Update 2013 embodies these fundamental lessons that are listed here:

- Sustainable development and water use, and environmental stewardship foster a strong economy, protect public health and the environment, and enhance our quality of life. Managing for sustainability relies on the full consideration of social, economic, and environmental values in all phases of planning and policy- and decision-making. Sustainable water use ensures that we develop and manage our water and related resources in a way that meets present needs while protecting and enhancing our watersheds and the environment and assures our ability to meet the needs of the future.
- Integrated water management at regional and statewide scales is the basis of planning for California’s water future with actions that provide multiple benefits. Reducing uncertainties and assessing risks to the water supply and flood systems are essential for developing plans that also allow us to sustain our water uses, systems, and resources.
- A diversified portfolio of resource management strategies improves system flexibility and resiliency for changing and extreme hydrologic conditions.
- Solutions to California’s water and flood management challenges are best planned and carried out on a regional basis. Hydrologic, demographic, geopolitical, socioeconomic, and other differences among California’s regions demand that the mix of water management strategies be suited to meet each region’s needs for the long term.
- Water conservation, recycling, and greater system efficiency in California must continue to be a fundamental strategy for all regions and individual water users in California. The cumulative effect of each decision to use water more efficiently has an enormous impact on future water supplies and water quality.
- California can better prepare for future droughts and climate change and improve water supply reliability and water quality by taking advantage of the extensive water storage capacity of groundwater basins when managed in closer coordination with surface storage and other water supply sources when available. These supplies include but are not limited to recycled municipal water, surface runoff and flood flows, urban runoff and storm water, imported water, water transfers, and desalination of brackish and sea water.

- California must protect the quality of its surface water and groundwater and use available supplies with greater care because water will always be a precious resource.
- California needs additional groundwater and surface water storage capacity. Storage gives water managers tremendous flexibility to invest in a greater number of resource management strategies, meet multiple needs, and provide vital reserves in drier years. In many cases, storage is necessary for benefits from other resource management strategies to occur such as water-dependent recreation, conjunctive management, conveyance, and environmental stewardship.
- Management to sustain the California Delta will require that a healthy Delta ecosystem and a reliable water supply for California be co-equal goals, and that we recognize the Delta as a unique and valued area.
- State government has a lead role in coordinating the water management activities of federal, Tribal, regional, and local governments and agencies and developing stable strategies for financing water management actions.
- Science and technology are providing new insights into threats to our watersheds — including our waterways and groundwater basins—from climate change and other stressors. California must use this knowledge to take protective actions and manage water in ways that protect and restore the environment.

Focus of Update 2013 — Three Overarching Themes

The complete Update 2013 (all volumes) contains a large variety of information as outlined in Chapter 1 and in the Document Guide. This information serves many purposes among a wide variety of audiences such as elected officials, planners, Tribal entities, academia, the general public, and others. While Update 2013 contains many refinements from Update 2009, Update 2013 has significantly advanced the State’s strategic plan in three critical areas. In order to address challenges and build upon past successes, the California Water Plan Update 2013 recommends additional strategies and actions to:

- Enhance regional and statewide integrated water management
- Strengthen government agency alignment
- Invest in innovation and infrastructure.

These themes provide the focus for refining and advancing the strategic plan contained in Update 2013 and are applicable to every level of resource planning. These themes are interconnected and are never considered separately. The strategic planning embraces these three themes as the basis for developing tools, plans, actions, and achieving results portrayed in the objectives of the *California Water Plan Update 2013*.

The objectives are described later in Chapter 3 and actions to meet the objectives are described in Chapter 8, “Implementation Plan.”

The three themes that emerged during the development of Update 2013 are described below.

Enhancing Regional and Statewide Integrated Water Management

The first theme for Update 2013 is to improve integrated water management and covers both regional and statewide scales. With Update 2013, the State is renewing its commitment to integrated water management. IWM is a strategic approach to plan and implement water management programs that combines flood management, environmental stewardship, and water supply actions to deliver multiple

economic, environmental, and social benefits across watershed and jurisdictional boundaries. The strategic plan included in Update 2013 builds on the foundation for IWM presented in Update 2009.

Integrated water management provides a set of principles and practices that include strengthening government agency alignment through open and transparent planning process. This leads to stakeholder and decision-maker support for investment in various aspects of resource management such as innovation and infrastructure. This support provides increased advocacy and the number/variety of potential implementers and financiers.

PLACEHOLDER Box 3-2 Integrated Water Management — What and Why

[Any draft tables, figures, and boxes that accompany this text for the advisory committee draft are included at the end of the chapter.]

Integrated State and Regional Water Management (IWM and IRWM, respectively) practices have made strides over the past 10 years, and Update 2013 encourages the expansion and enhancement of this practice.

The following key concepts enhance successful IWM planning:

- **Broad-based Knowledge** — The IWM approach relies on blending knowledge from a variety of disciplines, including engineering, economics, environmental sciences, public policy, and public information. It includes information gathering and other tools, policies, planning, regulations, and investments. Technical analyses simultaneously consider flood management, water supply, water quality, land use, water supply, ecosystem, and other actions to deliver multiple benefits at watershed and basin scales. This approach also promotes system flexibility and resiliency to accommodate changing conditions such as regional preferences, ecosystem needs, climate change, flood or drought events, and financing capabilities.
- **High Value, Multiple Benefits** — IWM recognizes that localized, narrowly focused projects are not the most cost-effective use of public and ratepayer resources and often have negative unintended consequences within regions. The IWM approach helps deliver more benefits at a faster pace, using fewer resources, than what is possible from single-benefit projects.
- **Broad Access to Funding Sources** — One of the benefits of using an IWM approach is the potential to access funding sources that may not have been available to single-benefit projects. This is particularly important to achieving sufficient and stable funding for long-term flood management.
- **Collaboration and Alignment Are Necessary** — Efforts to effectively manage California natural resources will require unprecedented alignment and cooperation among public agencies, Tribal entities, landowners, interest-based groups, and other stakeholders. Collaboration is required to prioritize actions and garner enough community support for investment to occur and be sustained. Better agency alignment of plans, policies, and regulations is needed to improve and expedite implementation.

The objectives and the related actions described in Chapter 8, “Implementation Plan,” collectively are the proposed improvements in IWM.

Strengthening Government Agency Alignment

The second theme for Update 2013 is strengthening government agency alignment. Update 2013 includes actions to make significant improvements in agency alignment from that presented in Update 2009. The primary purpose for improving alignment of government agencies is to expedite implementation of resource management strategies and help assure efficient achievement of multiple objectives. This includes collaboration with regulatory agencies to reduce time and costs required to implement IWM projects while protecting and enhancing natural resources.

PLACEHOLDER Box 3-3 [Title to Come]

[Any draft tables, figures, and boxes that accompany this text for the advisory committee draft are included at the end of the chapter.]

[Note to reviewer: This section will include information as appropriate from the regulation alignment whitepaper under development by Association of Resource Conservation Districts, ACWA, and Floodplain Management Association. (when available?).]

Currently, project implementers must navigate and comply with California's labyrinth of uncoordinated and at times conflicting laws and regulations that lead to project delays and mounting planning and compliance costs. These ultimately create significant difficulties in meeting basic community safety and water supply needs, along with goals outlined in Update 2013. This is even true for small projects that are well planned, have the voluntary support of private landowners, and would provide multiple benefits. In fact, project participants (such as landowners and financiers) that have gone through the permitting process are often not willing to tackle the process again. Those who have heard about the process second hand, tend to opt out when presented with opportunities to contribute. Addressing this challenge represents a critical scope of work. It is important to acknowledge that regulations can and do also provide basic community safety and water supply needs. They also help meet many Water Plan goals. Update 2013 promotes innovation for all IWM tools including all regulation and administrative tools.

At the same time, planning a project within the current regulatory environment is technically complex making it difficult for a single entity to comprehend all the geophysical and social complexities and dynamics of resource management and planning. California also has a wide variety of climates, landforms, institutions as well as a very diverse, place-based range of cultures that can best be described as anthrodiversity (e.g., the human aspect of biodiversity that denotes the value of sustaining varied human habitats, such as rural, suburban, and urban communities). This means that in a state as large and diverse as California, data management, planning, policy making and regulation must occur in a very collaborative, regionally-based manner with the ultimate product being a composite of input and data from a large variety of elected officials, opinion leaders, stakeholders, scientists, and subject experts. Sound outcomes rely on a blend of subject expertise and perspectives woven together (e.g. hydrology, climatology, engineering, earth sciences) into comprehensive policies and implementation decisions that are place-based and regionally appropriate.

Effective delivery of IWM requires: (1) confidence in the estimated benefits and costs (including negative impacts) of the planned IWM activities; (2) stakeholder support; and (3) funding. None of these can be achieved without extensive collaboration, improved government alignment, and trust and integrity throughout the entire plan development process.

Openness, collaboration, and transparency involve a blend of communications, collaboration, and engagement efforts. Building on what was done for Updates 2005 and 2009, the Update 2013 outreach and engagement process was designed to provide timely and meaningful participation by agencies and stakeholders. For Update 2013 new tools were developed to communicate, share information, and obtain feedback from California Native American Tribal governments, federal and local agencies, topic-based caucuses, communities, individuals, and organizations. The Update 2013 outreach and engagement process is described in Volume 4, “Reference Guide,” article Process Guide — California Water Plan Update 2013.

PLACEHOLDER Box 3-4 Agency Alignment Value Statement

[Any draft tables, figures, and boxes that accompany this text for the advisory committee draft are included at the end of the chapter.]

PLACEHOLDER Figure 3-5 Water Plan Update 2013 Collaboration Graphic

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Strides have been made to improve alignment such as the formation and engagement of Water Plan State Agency Steering Committee, Water Plan Federal Agency Network (FAN), and 48 regional water management groups. However, local, State, federal and tribal governments often do not yet collaborate to the degree necessary to effectively manage the challenges described above. Sample impacts of insufficient government alignment include the fact that planning and permitting costs of projects frequently exceed the implementation and acquisition costs for many infrastructure and ecosystem enhancement activities. In many other cases, program or project implementation has yet to occur despite decades of planning activities. All the while, benefits of projects are forgone due to implementation delays.

The United States Government Accountability Office broadly defined collaboration as any joint activity that is intended to produce more public value than could be produced when the agencies act alone. They also described how agencies can enhance and sustain their collaborative efforts by engaging in the eight practices identified below:

- Establish mutually reinforcing or joint strategies.
- Identify and address needs by leveraging resources.
- Agree on roles and responsibilities.
- Establish compatible policies, procedures, and other means to operate across agency boundaries.
- Develop mechanisms to monitor, evaluate, and report on results.
- Reinforce agency accountability for collaborative efforts through agency plans and reports.
- Reinforce individual accountability through performance management systems.

At the same time, funding and stakeholder support must occur prior to the effective delivery of desired IWM benefits. Enough certainty or confidence in the planned IWM activity is required to receive stakeholder support through the public administration process and, ultimately, receive funding. None of these things can occur without extensive collaboration throughout the entire Water Plan Update process.

If all partners have the same understanding of the project regardless of their individual needs, the project can be more easily implemented. Collaboration necessary to achieve stronger government agency alignment begins with establishing a common understanding at every stage of project or program development. Different partners have different perspectives on what they hope a project or program should achieve. For example, project implementers may think very differently about a project than those who are responsible for operating and maintaining the facility. State agencies may have different perspectives on a project. Each partner is influenced by public and stakeholder advocacy for system improvements and operations. In turn, this advocacy influences government policy makers and financiers at the State, federal, tribal, local, and regional government levels.

The purpose for emphasizing collaboration throughout Update 2013 process goes well beyond sharing of information and project updates to stakeholders. Collaboration is required to help ensure that resource management recommendations achieve desired outcome by vetting, integrating suggestions and ultimately creating IWM recommendations that are implementable and supported by stakeholders and communities. It also helps create a California Water Plan Update process and a document that is accurate, complete, and clear.

Following are some examples of cross-cutting practices that agencies could take to improve alignment. Many of these and others are represented in the actions in Chapter 8, “Implementation Plan.”

1. Identify all other agencies with overlapping or related responsibilities and engage them early and often with their planning.
2. Respect and value the roles and responsibilities of other agencies (e.g. not explicitly or implicitly seeking other agencies budgets, responsibilities, or positions).
3. Work together to identify common goals for integrated water management.
4. Strive to align goals and recommendations across their plans.
5. Use inclusive, transparent, and collaborative processes to increase trust and improve relationships.
6. Coordinate monitoring and research on the highest priority innovations.
7. Use adaptive management to provide a framework for developing accurate and common understating of natural and human-made systems and potential solutions.
8. Engage all levels of relevant participants (from on-the-ground implementers to high level oversight) from early stages of planning.
9. Create a planning clearinghouse (data and master calendar).
10. Jointly develop fundamental principles for alignment (for state agency adoption).
11. Create a matrix showing where regulatory processes align, clash or leave gaps.

Investing in Innovation and Infrastructure

The third theme for Update 2013 is to improve investment in innovation and infrastructure. A stable, effective funding stream is an essential component for successful water resource implementation. California Water Plan Update 2013 provides strategies for future funding, a major improvement over Update 2009.

California has nearly \$600 billion of assets and over 7 million people at risk of flooding. There are also over 10,000 projects identified within the 48 integrated regional water management plans. In total, resource management actions will require up to \$500 billion dollars of future investment over the next few decades to reduce flood risk, provide reliable and clean water supplies, and enhance ecosystems and

their services. We are beginning to integrate resource management and planning, but funding remains fragmented, unstable and inefficient which limits opportunities for further integration.

PLACEHOLDER Box 3-5 [Title to Come]

[Any draft tables, figures, and boxes that accompany this text for the advisory committee draft are included at the end of the chapter.]

Other compounding challenges include the fact that debt is at near record levels, existing bond funds will be fully allocated by 2017, willingness of the public to pay for government activities is waning, investment in infrastructure and ecosystem values and services has been deferred for decades, and future federal funding is highly uncertain. This debt level increases pressure on developing alternative financing strategies that capitalize on local, State, and Federal cost sharing and integrated management.

Very little of the total state IWM funding allows discretion or flexibility. Bond and legislative language designates funding purposes. General obligation bonds backed by property taxes and the General Fund are required to be used for capital projects not operation and maintenance. Revenue and lease-revenue bonds, typically used by local agencies, offer more flexibility. In general, the discrete nature of bond money makes this financing source better suited for one-time investments.

State expenditures average \$8.7 billion per year with a peak of just over \$12 billion in FY 2010. This is largely due to bond money from continued appropriations of Propositions 1E and 84. Federal expenditures average \$1.2 billion per year with a peak of \$1.4 billion in FY 2001 and again in FY 2005. Local expenditures comprise the largest component averaging \$15.5 billion per year. Local expenditures peaked at just over \$17 billion in FY 2010. This is likely due to increased subventions and loans from DWR due to Proposition 1E and 84. While overall IWM expenditures in California have been increasing in recent years, federal investment is shrinking relative to state and local investment.

Through intensive collaboration with the Update 2013 Finance Caucus, the investment categories presented below in Box 3-6 helped participants towards a common understanding of potential investments and an effective role for State government. This approach was useful for aligning funding and finance planning processes across over 2,300 local, State, and federal government agencies, each with its own planning processes and scales.

PLACEHOLDER Box 3-6 Categories for Integrated Water Management Investment

[Any draft tables, figures, and boxes that accompany this text for the advisory committee draft are included at the end of the chapter.]

Update 2013 provides a more comprehensive approach to State IWM funding and finance compared to historical and current practices of prioritizing activities and projects by a combination of funding earmarks and a project's readiness for construction.

Chapter 2, "California Water Today," describes existing local, State, and federal IWM spending and debt levels. Currently, projects that tend to be most implementable, most consistent with priorities of a particular funding source or that happen to be at the front of the queue when money becomes available are often not linked to multi-faceted strategic objectives. The approach used for Update 2013 promotes proactive planning and prioritization of activities to drive future investment decisions and funding. See

Chapter 7, “Finance Planning Framework,” for a description of finance categories and strategies including general obligation bonds, fees, taxes, and public private partnerships.

Two primary categories of investment are innovation and infrastructure. Infrastructure includes structures and facilities that support human activities, but it also includes green infrastructure (i.e., such as wetlands, riparian habitat and watershed systems). Innovation includes the nonstructural improvements such as development of new analytical tools. Both categories may include the capital cost of constructing a facility or restoring habitat and the long term operation and maintenance costs which have often been an afterthought to implementation and not adequately financed over their useful life.

Innovation and infrastructure are further broken down into investment categories (again, for State government policy-making purposes) as shown in Box 3-6. In addition to the categories of investment shown in Box 3-6, there are many resource management and administrative tools included in Update 2013.

There are 30 resource management strategies presented in Volume 3 which are grouped by the categories listed below.

Resource management strategy categories:

- Reduce Water Demand
- Improve Operational Efficiency & Transfers
- Increase Water Supply
- Improve Flood Management
- Improve Water Quality
- Practice Resource Stewardship
- People and Water

Similar to the resource management strategies, described in Volume 3 of Update 2013, which focus on actions, there are six administrative tools described in Update 2013. See Chapter 7, “Finance Planning Framework,” for more on administrative tools. The seven categories of administrative tools are listed below.

Administrative tools:

- Collaborative decision-making
- Education
- Legislation
- Voter-approved propositions
- Regulation
- Permitting
- Litigation

The Update 2013 approach to guiding future investment improves the apportioning and better informs the use of different financial strategies. The Investment in Innovation and Infrastructure theme has a major role in advancing Update 2013 from Update 2009. In weaving the theme throughout this Update 2013 strategic plan, the following needs played a major role in preparation of the Chapter 7, “Finance Planning

Framework,” and the financing actions in Chapter 8, “Implementation Plan.” Development of the finance strategy for Update 2013 considered ways to:

1. Formalize water resources investment principles and guidelines as described in Chapter 7, “Finance Planning Framework”).
 - A. Funding and investment decisions should be based on transparent, understandable analysis of estimated future benefits and desired outcomes.
 - B. Technical and economic feasibility are basic prioritization criteria that promote accountability to tax and ratepayers through the wise and efficient stewardship of tax and ratepayer financial resources.
2. Stipulate standardized benefit categories, benefit metrics or calculations, and benefit and cost allocation methods.
3. Set a framework to prioritize future investments:
 - A. Meet basic public health and safety needs
 - B. Protect public trust resources
 - C. Protect unique real property interests.
 - D. Conduct and invest in innovation in Governance of State IWM Improvements, Planning and Public Engagement Improvements, Government Agency Alignment Improvements, Information Technology (Data and analytical tools), and Water Technology (Research, development and implementation incentives)
4. Recognize the critical role of public-private partnerships.
5. Define public benefits and develop a clear and analytically based methodology for assessing public benefits.
6. Provide guidance on defining uncertainties of future costs and benefits (e.g., climate change uncertainties).
7. Create incentives for projects that achieve systemwide benefits and help regions identify systemwide goals and guide local and regional work towards these systemwide goals.
8. Coordinate interagency regulatory alignment so that regulatory agencies are working together to create more transparency, accountability, cost-efficiencies, and flexibility.
9. Reduce duplication and fragmentation within State funding with a more flexible approach that can more easily coordinate State agency budgets and move funding between agencies in pursuit of common goals.
10. Develop a loan guarantee program to reduce interest costs for local agencies.
11. Create a financial toolkit or funding portal that would identify IWM funding sources and match potential IWM funding mechanisms, federal funds, and fees to IWM categories of activities.
12. Create report cards in the California Water Plan that track investment in categories of benefits.

Looking to the Future — The Roadmap

The immediate and changing conditions and priorities described above and the ongoing challenges described in Chapter 2 require that Californians step up existing efforts to provide integrated, reliable, sustainable, and secure water resources and management systems for our health, public safety, economy, and ecosystems today and for generations. We need to continue investments in water efficiency and conservation in our communities and on the farm. To accomplish this requires a strategic Water Plan with a vision and goals, and an implementation plan with objectives and near-term and long-term actions. The plan must build on our accomplishments since Update 2009, fundamental lessons, and water resource management learned in recent years.

The vision, mission, goals, objectives, and guiding principles in the following sections are the roadmap for future IWM implementation. These are largely the same as those presented in Update 2009. However, Update 2013 builds on these as we continue to learn more about our challenges and opportunities. In addition, improvements in government agency alignment and investment in innovation and infrastructure requires additional objectives to capture these concepts.

PLACEHOLDER Box 3-7 Update 2013 Vision, Mission, and Goals

[Any draft tables, figures, and boxes that accompany this text for the advisory committee draft are included at the end of the chapter.]

PLACEHOLDER Box 3-8 Update 2013 Objectives

[Any draft tables, figures, and boxes that accompany this text for the advisory committee draft are included at the end of the chapter.]

PLACEHOLDER Box 3-9 Update 2013 Guiding Principles

[Any draft tables, figures, and boxes that accompany this text for the advisory committee draft are included at the end of the chapter.]

Companion Plans

Update 2013 has taken a first step in aligning State government plans by incorporating information and recommendations from companion planning documents of the State Agency Steering Committee member agencies. Companion State plans and initiatives are those plans and programs by State, federal, tribal, and local government agencies that have a direct connection with the Water Plan. Chapter 4, “Companion Plans,” in this volume describes plans used to develop and augment the content in the Update 2013.

Role of State Government in Integrated Water Management

The guidance provided by the above vision, mission, goals, objectives, and principles are applicable to all levels of planning and by State, federal, and local agencies and other implementing entities. As described earlier, local agencies expenditures on IWM have comprised the largest component of all agency investments — a trend that is expected to continue. Local agencies will continue to be primarily responsible for funding projects and programs that create local benefits and to participate in larger systemwide projects that benefit them.

The role of State government in IWM is to fulfill its basic day-to-day obligations and invest in IWM innovation and infrastructure.

Basic Obligations

The basic day-to-day obligations of State government in IWM include:

- **Represent California in government-to-government interactions** with the federal government, other states, and other sovereign nations and tribal governments.
- **Meet basic public health and safety needs** by regulating minimum public health standards.
- **Protect public trust resources** in by regulation and in planning and allocation of water resources. The public trust doctrine recognizes that certain natural resources, including water, tide and submerged lands, the beds and banks of navigable rivers, and fish and wildlife

resources are owned by the public and held in trust for present and future generations of Californians.

- **Protect unique real property interests.** The State has a fundamental responsibility to California taxpayers to protect the State real property assets it owns and reduce State liabilities.

Innovation and Infrastructure

Investing in innovation and infrastructure is a shared responsibility across local, State, federal, Tribal, and private entities. State government has traditionally delegated IWM investment decisions to local governments and regions. State government should continue to focus its investments within a framework that empowers local governments and regions, supports regional decision making, and encourages regional self-sufficiency.

State government should take a lead role in investing in innovation actions for the benefit of all regions. Innovation includes a broad range of activities that comprises governance, planning and process improvements, data, tools, and water technology research and development. The State's investment in innovation will provide processes and information that will aid decision making throughout the state and support more cost-effective infrastructure investments by regional and local entities.

The State invests in its own real property infrastructure (i.e., State Water Project and State-federal flood management system). The State also has a role in creating incentives for the planning, construction, and management of natural and human infrastructure in fulfillment of the State's strategic objectives. This is implemented at various geographical and jurisdictional scales throughout the State, including local, groundwater basin, watershed, regional, interregional, State, interstate, international and tribal. Although this infrastructure may be owned and operated by other entities, the State has a role in creating incentives that help achieve the State's goals.

The State's role in investing in innovation and infrastructure should be focused in the following four areas to provide:

1. **What regions cannot accomplish on their own.** The State has a role in assisting regions if they cannot accomplish necessary water management services on their own, such as providing basic public health and safety. The State predominantly delegates the responsibility to provide basic public health and safety needs for local governments to achieve while the State enforces regulations to ensure that minimum standards are met. However, the State has a role in assisting regions that cannot accomplish basic public health and safe needs on their own, such as disadvantaged communities or some tribal communities. The State can provide technical and financial assistance to these communities. In some circumstances, the State can also function as a service provider of last resort and provide these basic services itself when justified.
2. **What involves interregional, interstate, or international issues.** It is common for natural streams and infrastructure to cross regional, State, and international boundaries. In its role to represent California in government-to-government relationships, the State must take a lead role in international, interstate, or trans-boundary issues that extend beyond the geographical reach and jurisdictional authority of local and regional agencies. This includes, for example, negotiation with other states or Mexico regarding California's rights and interests in resources provided by the Colorado River. In addition to interstate and international issues, the State also

has a role in promoting collaboration within and among regions for the benefit of the entire state.

3. **What the State can do more efficiently.** The State is uniquely suited to implement some activities more efficiently than other agencies or organizations because it can leverage more resources and can provide greater economies of scale. The State has a responsibility to leverage these advantages to address specific needs common to all agencies involved in IWM. Information from these activities benefits the entire State. Operating on a statewide scale can also reduce inconsistencies or redundancies among regions. Examples of activities that the State can do more efficiently that provide value statewide include:
 - A. **Provide data, information, decision support, modeling tools, and expertise in specialty areas.** The State is uniquely suited to collect, store, and disseminate water resources-related data and information to support regional and statewide water system modeling, analytical tools, and decision support tools. State government expertise in specialty water resource areas should also be used to address the critical water-related issues of the State. For example, State government expertise in climate change research should help monitor, predict, and prepare for the effects of climate change on California's water and flood protection systems and the environment.
 - B. **Conduct and coordinate public outreach and policy guidance on water-related issues.** The State is uniquely suited to assist water agencies, local governments, tribes, and non-governmental organizations, to educate the public and legislature on water issues. Providing a unified, coordinated message on key water issues would help convey their importance to the public and the legislature.
 - C. **Facilitate process improvement and government agency alignment.** The State can play a major role in working with agencies to improve planning and project development processes.
 - D. **Facilitate systemwide management.** The State is uniquely suited to facilitate development and implementation of water projects that have impacts on a systemwide scale such as major storage, large system flood management, and Delta improvements. Local agencies often are limited in their ability to work on a systemwide scale because of jurisdictional limitations. The State has more flexibility to assert leadership in interregional projects on a systemwide scale that spans geographic and agency boundaries. The State may therefore find it in their interest to incentivize local and regional projects that provide benefits to the State, but may not be financially feasible at the local or regional level. For example, investing in a rural region located in an upper watershed may be the most cost-effective solution for increasing overall water supplies to the State, but local agencies within that region may lack the resources or may not find it in their interest to make that investment themselves.
 - E. **Provide regulatory oversight and alignment.** The State is uniquely suited to provide regulatory oversight to protect public health and safety and public trust values, including water quality, environmental protection, flood management, and dam safety through several State agencies. In addition to establishing, monitoring, and enforcing regulations, the State also has a role to promote and facilitate alignment of regulatory processes involving federal and State regulations. Better interagency regulatory alignment helps improve consistency and predictability in regulatory standards and addresses unclear, conflicting, inconsistent, or mutually exclusive regulatory objectives or requirements for projects.

- F. **Conduct statewide master planning.** The State is uniquely suited to conduct statewide master planning. This includes, for example, preparing California Water Plan updates as a public forum to integrate State, federal, Tribal, regional, and local plans to meet the State's future agricultural, urban, and environmental water demands and water management objectives.
- 4. **What provides broad public benefits.** The State has a role in promoting activities that have broad public benefits, and advancing sustainability through public safety, environmental stewardship, and economic stability. Public benefits are defined as very diffuse benefits that cannot be easily associated with specific user groups or a particular set of beneficiaries.

Box 3-1 [Title to Come]

California must make its business and finance climate more attractive with a higher degree of certainty that flood damages will be averted, water supplies will be reliable and predictable and that recreational opportunities and environmental stewardship will be improved.

Box 3-2 Integrated Water Management — What and Why

- Integrated Water Management (IWM) is a strategic approach to plan and implement water management programs that *combines* flood management, ecosystem enhancement and water supply actions to deliver multiple benefits *across watershed and jurisdictional boundaries*.
- Integrated Water Management approach maximizes limited resources to provide for *increased public well-being*.
- Well-implemented integrated water management projects *enjoy broader support* and are thus less likely to be delayed or stopped during the implementation phase.
- Fostering broader implementation of IWM is intended to improve or restore expected levels of service within flood and water management systems statewide while also *improving system resiliency* (the ability of the systems to respond to and recover from significant stressors).
- IWM program delivery will be conducted using measurable objectives that *provide for accountability of public investment* and transparency on the value that society will attain from investing in IWM initiatives.

Box 3-3 [Title to Come]

Project implementers must navigate and comply with California's labyrinth of uncoordinated and at times conflicting laws and regulations that lead to project delays and mounting planning and compliance costs.

These ultimately create significant difficulties in meeting basic community safety and water supply needs, along with goals outlined in the Water Plan.

Box 3-4 Agency Alignment Value Statement

The California Biodiversity Council's initiative to improve the alignment of the plans, programs, policies, and regulations of its member agencies will enable the Council to achieve its founding goals with:

- More consistent vision of desired conditions for natural resource management, conservation and stewardship across California (less fragmented work in silos)
- More efficient and cost-effective planning and implementation of natural resource conservation projects (less duplication and waste)
- More holistic, watershed-scale policies and regulations (fewer agency conflicts)
- More outcome-based and regionally-appropriate agency policies and regulations (focus on the What and less on How)
- Better sharing of information, expertise and tools (less duplication by leveraging resources)
- Expedited conservation project implementation with more consistent and effective technical and financial assistance to project proponents (lower project cost and fewer delays)

Box 3-5 [Title to Come]

"Of all the infrastructure types, water is the most fundamental to life, and is irreplaceable. ... Much of the drinking-water infrastructure is old and in need of replacement. ...

"Failures in drinking-water infrastructure can result in water disruptions, impediments to emergency response, and damage to other types of essential infrastructure."

— *Failure to Act: The Economic Impact of Current Investment Trends in Water & Wastewater Treatment Infrastructure*
(American Society of Civil Engineers January 2013)

Box 3-6 Categories for Integrated Water Management Investment

Innovation

- Governance of State IWM Improvements
- Planning and Public Engagement Improvements
- Information Technology (Data and analytical tools)
- Government agency alignment improvements
- Water Technology
- (Research, development and implementation incentives)

Infrastructure (human and ecosystem), implemented at the following scales

- Local
- Groundwater basin
- Watershed
- Regional
- Interregional
- State
- Interstate
- International
- Tribal

Box 3-7 Update 2013 Vision, Mission, and Goals

Vision

The vision is a picture of the future with implementation of the Update 2013. It is intended to be the inspiration for the strategic plan. The Update 2013 vision is:

~~California has healthy watersheds and integrated, reliable, and secure water resources and management systems that enhance public health, safety, and quality of life in all its communities; sustain economic growth, business vitality, and agricultural productivity; and protect and restore California's unique biological diversity, ecological values, and cultural heritage.~~

California has healthy watersheds and reliable and secure water resources and management systems. Public health, safety, and quality of life in all its rural, suburban and urban communities are significantly improved due to advancements in integrated water management. The water system provides the certainty needed for sustainable economic growth, business vitality, and agricultural productivity. California's unique biological diversity, ecological values, and cultural heritage are protected and have substantially recovered.

Mission

The mission statement describes the original purpose in preparing Update 2013. The California Water Code requires the Department of Water Resources to publish an update of the California Water Plan every five years. Update 2013 is the 11th in a series of such plans prepared since 1957. The Update 2013 mission is:

Updating the California Water Plan provides State, federal, Tribal, regional, and local governments and organizations a continuous strategic planning forum to collaboratively:

Recommend strategic goals, objectives, and near-term and long-term actions that would conserve, manage, develop, and sustain California's watersheds, water resources, and management systems;

Prepare response plans for floods, droughts, and catastrophic events that would threaten water resources and management systems, the environment, property, and the health, welfare, and livelihood of the people of California; and

Evaluate current and future watershed and water conditions, challenges, and opportunities.

Goals

Goals describe the broad enduring values and major conditions to which the State aspires with respect to implementing Update 2013. The Update 2013 goals are:

1. California has water supplies that are adequate, reliable, secure, affordable, sustainable, and of suitable quality for beneficial uses to protect, preserve, and enhance watersheds, communities, and environmental and agricultural resources.
2. State government supports integrated water resources planning and management through leadership, oversight, and public funding.
3. Regional and interregional partnerships play a pivotal role in California water resources planning, water management for sustainable water use and resources, and increasing regional self-sufficiency.
4. Water resource and land use planners make informed and collaborative decisions and implement integrated actions to increase water supply reliability, use water more efficiently, protect water quality, improve flood protection, promote environmental stewardship, and ensure environmental justice in light of drivers of change and catastrophic events.
5. California is prepared for climate uncertainty by developing adaptation strategies and investing in a diverse set of actions that reduce the risk and consequences posed by climate change, that make the system more resilient to change, and that increase the sustainability of water and flood management systems and the ecosystems they depend on.
6. Integrated flood management, as a part of integrated water management, increases flood protection, improves preparedness and emergency response, enhances floodplain ecosystems, and promotes sustainable flood management systems.
7. The benefits and consequences of water decisions and access to State government resources are equitable across all communities.

Box 3-8 Update 2013 Objectives

Objectives describe “what” will be done to achieve the goals of the strategic plan. Objectives are the most measurable elements among the vision, goals, etc. The objectives and their related actions are the backbone of Chapter 8, “Implementation Plan.” The following is a summary of the Water Plan’s 16 objectives:

1. **Expand Integrated Regional Water Management.** Promote, improve, and expand integrated regional water management to create and build on partnerships that are essential for California water resources planning, sustainable watershed and floodplain management, and increasing regional self-sufficiency.
2. **Use and Reuse Water More Efficiently.** Use water more efficiently with significantly greater water conservation, recycling, and reuse to help meet future water demands and adapt to climate change.
3. **Expand Conjunctive Management of Multiple Supplies.** Advance and expand conjunctive management of multiple water supply sources with existing and new surface water and groundwater to prepare for future droughts and climate change.
4. **Protect Surface Water and Groundwater Quality.** Protect and restore surface water and groundwater quality to safeguard public and environmental health and secure California’s water supplies for beneficial uses.
5. **Expand Environmental Stewardship.** Practice, promote, improve, and expand environmental stewardship to protect and enhance the environment by improving watershed, floodplain, and instream functions and to sustain water and flood management systems.
6. **Practice Integrated Flood Management.** Promote and practice integrated flood management to provide multiple benefits including better emergency preparedness and response, higher flood protection, more sustainable flood and water management systems, and enhanced floodplain ecosystems.
7. **Manage a Sustainable California Delta.** Set as co-equal goals a healthy Delta ecosystem and a reliable water supply for California and recognize the Delta as a unique and valued community and ecosystem to promote and practice management for a sustainable California Delta.
8. **Prepare Prevention, Response, and Recovery Plans.** Prepare prevention, response, and recovery plans for floods, droughts, and catastrophic events to help residents and communities, particularly disadvantaged communities, make decisions that reduce the consequences and recovery times of these events when they occur.
9. **Reduce Energy Consumption of Water Systems and Uses.** Reduce the energy consumption of water and wastewater management systems by implementing the water-related strategies in AB 32 Scoping Plan to mitigate greenhouse gas emissions.
10. **Improve Data and Analysis for Decision-making.** Improve and expand monitoring, data management, and analysis to support decision-making, especially in light of uncertainties, that support integrated regional water management and flood and water resources management systems.
11. **Invest in New Water Technology.** Identify and fund applied research on emerging water technology [and other innovation](#) to make [actions](#) attainable and more cost effective [and to support decision making](#).
12. **Improve Tribal Water and Natural Resources.** Develop Tribal consultation, collaboration, and access to funding for water programs and projects to better sustain Tribal water and natural resources.
13. **Ensure Equitable Distribution of Benefits.** Increase the participation of small and disadvantaged communities in State processes and programs to achieve fair and equitable distribution of benefits. Consider mitigation of impacts from the implementation of State programs and policies to provide safe drinking water and wastewater treatment to all California communities and to ensure that these programs and policies address the most critical public health threats in disadvantaged communities.
14. **Coordinate Land Use and Water Planning.** [\[Under development.\]](#)
15. **Provide Sustainable Funding for Investments in Innovation and Infrastructure.** [\[Under development.\]](#)
16. **Improve Planning, Outreach, Education, and Project/Program Implementation Processes.** [\[Under development.\]](#)

Box 3-9 Update 2013 Guiding Principles

The guiding principles are core values or philosophies on how the strategic plan should be implemented. These represent cross cutting guidance and considerations for implementation of all objectives and their related actions. The following is a summary of the guiding principles for Update 2013:

1. **Use a broad, stakeholder-based, long-view perspective for water management** to (1) promote multi-objective planning with a regional focus, (2) coordinate local, regional, inter-regional, and statewide initiatives, (3) recognize distinct regional problems, resources, assets, and priorities, and (4) emphasize long-term planning (30- to 50-year horizon) while identifying near-term actions needed to achieve the plan.
2. **Promote management for sustainable resources on a watershed basis.** Wisely use natural resources to ensure their availability for future generations. Promote activities with the greatest multiple benefits regionally and statewide. Consider the interrelationship between water supplies, water conservation, water quality, water infrastructure, flood protection, energy, recreation, land use, economic prosperity, and environmental stewardship on a watershed or ecosystem basis.
3. **Increase regional drought and flood preparedness system flexibility and resiliency.** Evaluate and implement strategies that reduce the impacts of droughts and floods in the region. In California, drought contingency planning and integrated flood management are important components of regional water planning.
4. **Increase regional self-sufficiency.** Implement resource management strategies that reduce dependence on long-term imports of water from other hydrologic regions, particularly for meeting additional future water demands and during times of limited supply such as a drought or interrupted supply after a catastrophic event, such as an earthquake. As part of a diverse water portfolio, short-term water transfers between regions that are environmentally, economically, and socially sound, can help increase regional self-sufficiency overall.
5. ~~Promote regional coordination and collaboration among local governments and agencies, public and private organizations, and Tribal governments and Tribal communities,~~ particularly those that are involved in activities that might affect the long-term sustainability of water supplies, water quality, and flood protection within the region. Regional planning should include a public review process with open and transparent decision-making and substantive Tribal consultation, as well as education and outreach for the public, tribes, stakeholders, and decision-makers. **Note to Reviewer: This principle is being advanced through the new Update 2013 Objective titled Improve Planning, Outreach, Education, and Project/Program Implementation Processes**
- 6.5. **Determine values for economic, environmental, and social benefits, costs, and tradeoffs to base investment decisions on sustainability indicators.** Evaluate programs and projects recognizing economic growth, environmental quality, social equity, and sustainability as co-equal objectives. When comparing alternatives, determine the value of potential economic, environmental, and social benefits; beneficiaries; costs; and tradeoffs. Include a plan that avoids, minimizes, and mitigates for adverse impacts.
- 7.6. **Incorporate future variability, uncertainties, and risk in the decision-making process.** Use multiple future scenarios to consider drivers of change and emerging conditions, such as population growth and climate change, when making planning, management, and policy decisions.
- 8.7. **Apply California's water rights laws, including the longstanding constitutional principles of reasonable use and public trust, as the foundation for public policymaking, planning, and management decisions on California water resources.** Recognize that certain natural resources including water, tide and submerged lands, the beds and banks of navigable rivers, and fish and wildlife resources are owned by the public and held in trust for present and future generations of Californians. Native American Tribes also depend on these natural resources for subsistence and cultural heritage. Effectively applying existing water rights laws and the twin principles of reasonable use and public trust will provide water for future generations while protecting ecosystem values.
- 9.8. **Promote environmental justice—the fair treatment of people of all races, cultures, and incomes.** State-sponsored or public-funded resource management projects must include meaningful community participation in decision-making, and consider factors like community demographics, potential or actual adverse health or environmental impacts, and benefits and burdens of the project on stakeholder groups.
- 10.9. **Use science, best data, and local and indigenous peoples' knowledge in a transparent and documented process.** When appropriate and possible, use data, information, planning methods, and analytical techniques that have undergone scientific review.